



STATE OF MISSOURI  
MISSOURI DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY PROGRAM  
**INJECTION WELL PERMIT APPLICATION**  
(TO DRILL, DEEPEN, PLUG BACK, OR CONVERT AN EXISTING WELL)

FORM OGC-31

<b>NOTE</b> ▶ Permit approval for drilling only, not injection. Approval or denial for injection determined after Mechanical Integrity Test results reviewed and official notification given.			
<input checked="" type="checkbox"/> APPLICATION TO DRILL <input type="checkbox"/> DEEPEN <input type="checkbox"/> PLUG BACK <input type="checkbox"/> FOR AN OIL WELL <input type="checkbox"/> OR GAS WELL			
NAME OF COMPANY OR OPERATOR Kansas Resource Exploration & Development, LLC			
DATE 07/29/2012			
ADDRESS 9393 W 110th Street, Suite 500	CITY Overland Park		
STATE KS	ZIP CODE 66210		
<b>DESCRIPTION OF WELL AND LEASE</b>			
NAME OF LEASE Belton Unit	WELL NUMBER RW-89		
ELEVATION (GROUND) 1083'			
WELL LOCATION (GIVE FOOTAGE FROM SECTION LINES) 4250 ft. from <input type="checkbox"/> North <input checked="" type="checkbox"/> South section line 2728 ft. from <input checked="" type="checkbox"/> East <input type="checkbox"/> West section line			
WELL LOCATION Sec. 16 Township 46 North Range 33 <input type="checkbox"/> East <input checked="" type="checkbox"/> West	LATITUDE N38 48' 49.946"		
LONGITUDE W94 34' 35.475"			
COUNTY Cass			
NEAREST DISTANCE FROM PROPOSED LOCATION TO PROPERTY OR LEASE LINE 1208 FEET			
DISTANCE FROM PROPOSED LOCATION TO NEAREST DRILLING, COMPLETED OR APPLIED - FOR WELL ON THE SAME LEASE 13 FEET			
PROPOSED DEPTH 650 feet 433' e!	ROTARY OR CABLE TOOLS Rotary		
DRILLING CONTRACTOR, NAME AND ADDRESS Utah Oil, LLC			
APPROX. DATE WORK WILL START 08/20/2012			
NUMBER OF ACRES IN LEASE 560	NUMBER OF WELLS ON LEASE INCLUDING THIS WELL, COMPLETED IN OR DRILLING TO THIS RESERVOIR 124		
NUMBER OF ABANDONED WELLS ON LEASE 0			
IF LEASE PURCHASED WITH ONE OR MORE WELLS DRILLED, FROM WHOM PURCHASED? NAME DE Exploration ADDRESS 4595 Highway K33, Wellsville, KS 66092			
NO. OF WELLS PRODUCING 71 INJECTION 44 INACTIVE 8 ABANDONED 0			
STATUS OF BOND <input type="checkbox"/> SINGLE WELL AMOUNT \$ <input checked="" type="checkbox"/> BLANKET BOND AMOUNT \$ 160,000			
<input checked="" type="checkbox"/> ON FILE <input type="checkbox"/> ATTACHED			
REMARKS: (IF THIS IS AN APPLICATION TO DEEPEN OR PLUG BACK, BRIEFLY DESCRIBE WORK TO BE DONE, GIVING PRESENT PRODUCING/INJECTION ZONE AND EXPECTED NEW INJECTION ZONE; USE BACK OF FORM IF NEEDED)			
<b>PROPOSED CASING PROGRAM</b>			
<b>APPROVED CASING - TO BE FILLED IN BY STATE GEOLOGIST</b>			
AMOUNT	SIZE	WT/FT	CEM.
20'	7"	14	8 sks
650'	2 7/8"	6.5	100 sks
I, the Undersigned, state that I am the COO of the KRed (Company), and that I am authorized by said company to make this report, and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct, and complete to the best of my knowledge.			
SIGNATURE [Signature]		DATE 11/29/12	
PERMIT NUMBER 20998		<input checked="" type="checkbox"/> DRILLER'S LOG REQUIRED <input checked="" type="checkbox"/> E-LOGS REQUIRED IF RUN	
APPROVED DATE 12-20-12		<input checked="" type="checkbox"/> CORE ANALYSIS REQUIRED IF RUN <input checked="" type="checkbox"/> DRILL SYSTEM TEST INFO REQUIRED IF RUN	
APPROVED BY Joseph A. [Signature]		<input type="checkbox"/> SAMPLES REQUIRED <input checked="" type="checkbox"/> SAMPLES NOT REQUIRED	
		<input type="checkbox"/> WATER SAMPLES REQUIRED AT _____	
<b>NOTE</b> ▶ THIS PERMIT NOT TRANSFERABLE TO ANY OTHER PERSON OR TO ANY OTHER LOCATION. APPROVAL OF THIS PERMIT BY THE OIL AND GAS COUNCIL DOES NOT CONSTITUTE ENDORSEMENT OF THE GEOLOGIC MERITS OF THE PROPOSED WELL NOR ENDORSEMENT OF THE QUALIFICATIONS OF THE PERMITTEE			



I, Leech of the Utah (Company), confirm that an approved drilling permit has been obtained by the owner of this well. Council approval of this permit will be shown on this form by presence of a permit number and signature of authorized council representative.

DRILLER'S SIGNATURE

B. Leech

DATE

10/9/12**PROPOSED OPERATIONS DATA**

PROPOSED AVERAGE DAILY INJECTION, PRESSURE 300 PSIG, RATE .035 BPD/GPM VOLUME 50 BBL/GAL

APPROVED AVERAGE DAILY INJECTION, (TO BE FILLED IN BY STATE GEOLOGIST) PRESSURE 300 PSIG, RATE .035 BPD/GPM, VOLUME 50 BBL/GAL

PROPOSED MAXIMUM DAILY INJECTION, PRESSURE 300 PSIG, RATE .035 BPD/GPM VOLUME 50 BBL/GAL

APPROVED MAXIMUM DAILY INJECTION, (TO BE FILLED IN BY STATE GEOLOGIST) PRESSURE 300 PSIG, RATE .035 BPD/GPM, VOLUME 50 BBL/GAL

ESTIMATED FRACTURE PRESSURE GRADIENT OF INJECTION ZONE 0.43 PSI/FOOT

DESCRIBE THE SOURCE OF THE INJECTION FLUID Squirrel sandstone produced water and rural water

**NOTE ►** SUBMIT AN APPROPRIATE ANALYSIS OF THE INJECTION FLUID. (SUBMIT ON SEPARATE SHEET)

DESCRIBE THE COMPATIBILITY OF THE PROPOSED INJECTION FLUID WITH THAT OF THE RECEIVING FORMATIONS, INCLUDING TOTAL DISSOLVED SOLIDS COMPARISONS

We have been using these injection fluids since the waterflood began with no issues. The formations respond to injection fluids. The injection fluids consist of recycled formation water and fresh water.

GIVE AN ACCURATE DESCRIPTION OF THE INJECTION ZONE INCLUDING LITHOLOGIC DESCRIPTIONS, GEOLOGIC NAME, THICKNESS, DEPTH, POROSITY, AND PERMEABILITY.

The upper, middle, and lower Squirrel Sandstone depth ranges from 500-600 feet with an average thickness of 90 feet. The upper Squirrel is generally 30 feet thick with 21% average porosity and 172 millidarcy's average permeability. The middle Squirrel is generally 20 feet thick with 22% average porosity and 1,000 millidarcy's average permeability. The lower Squirrel is generally 40 feet thick with 20.5% average porosity and 593 millidarcy's average permeability.

GIVE AN ACCURATE DESCRIPTION OF THE CONFINING ZONES INCLUDING LITHOLOGIC DESCRIPTION, GEOLOGIC NAME, THICKNESS, DEPTH, POROSITY, AND PERMEABILITY.

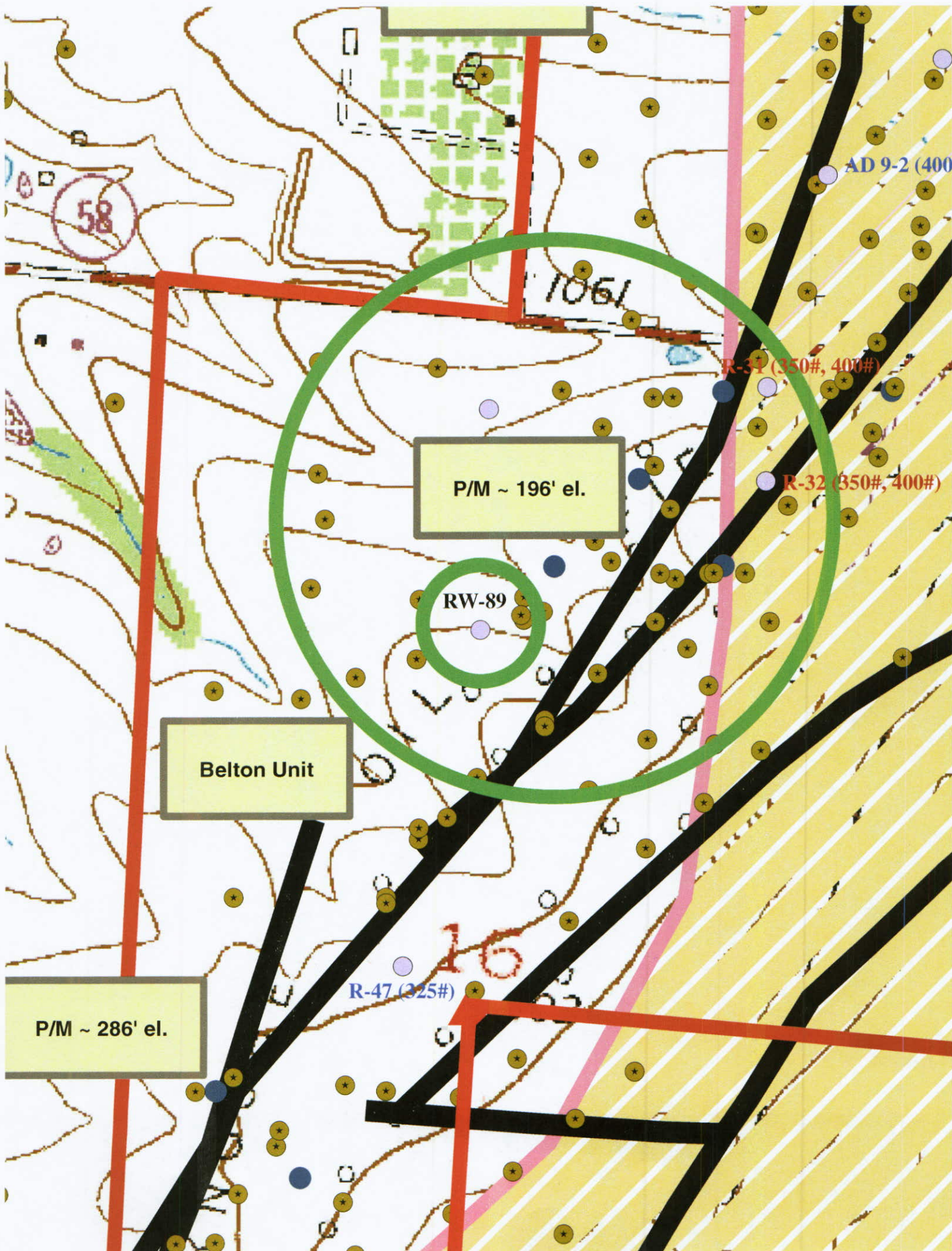
The confining layers of the Squirrel Sandstone consist of the the Fort Scott group above the sandstone and the Verdigris formation below the sandstone. The Fort Scott contains two prominent shales, the Blackwater Creek and the Excello, as well as the Blackjack Creek limestone that has a total thickness of 30-50 feet. The Verdigris formation consists of the the Ardmore limestone member and the Oakley shale with a total thickness of 20-40 feet. The zones are impermeable at less than 3% porosity.

SUBMIT ALL AVAILABLE LOGGING AND TESTING DATA ON THE WELL

GIVE A DETAILED DESCRIPTION OF ANY WELL NEEDING CORRECTIVE ACTION THAT PENETRATES THE INJECTION ZONE IN THE AREA OF REVIEW (1/2 MILE RADIUS AROUND WELL). INCLUDE THE REASON FOR AND PROPOSED CORRECTIVE ACTION.

No corrective action needed.








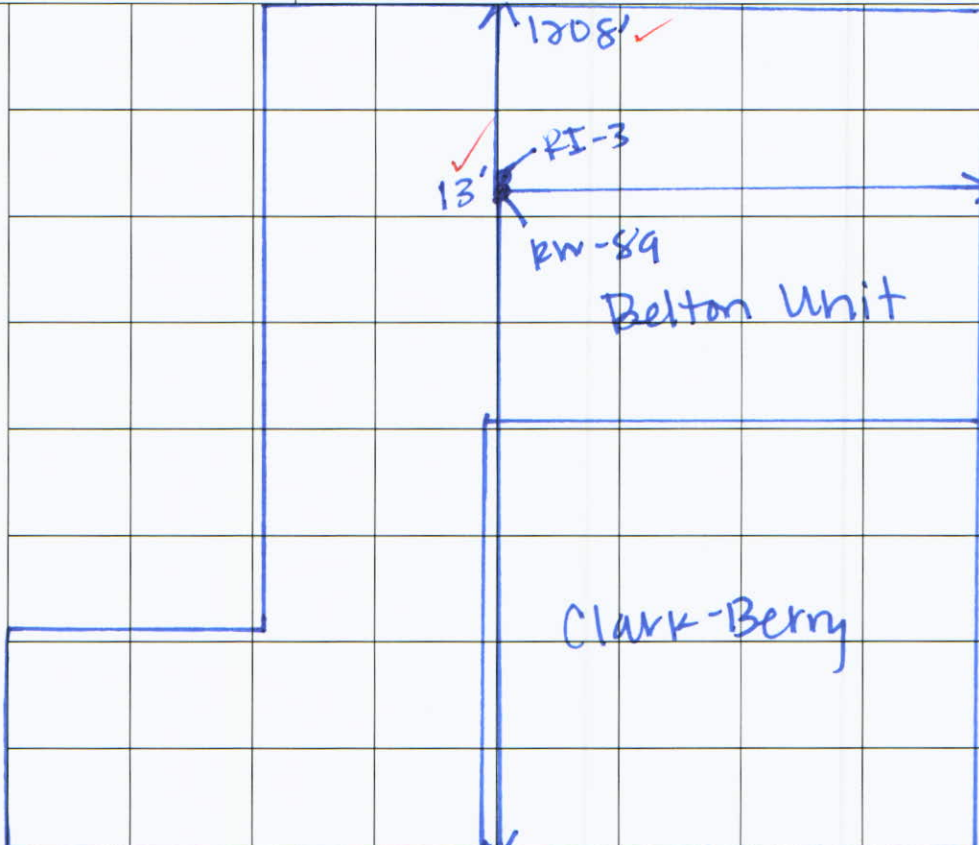


STATE OF MISSOURI  
MISSOURI DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY PROGRAM  
**INJECTION WELL LOCATION PLAT**

RECEIVED

FORM OGC-41

AUG 06 2012

OWNER'S NAME Kansas Resource Exploration & Development, LLC (K.R.E.D)		Mo Oil & Gas Council	
LEASE NAME Belton Unit - RW-89		COUNTY Cass	
WELL LOCATION (GIVE FOOTAGE FROM SECTION LINES) 4250 ft. from <input type="checkbox"/> North <input checked="" type="checkbox"/> South section line 2728 ft. from <input checked="" type="checkbox"/> East <input type="checkbox"/> West section line			
WELL LOCATION Sec. 16 Township 46 North Range 33 <input type="checkbox"/> East <input checked="" type="checkbox"/> West			
LATITUDE N38° 48' 49.946" ✓		LONGITUDE W94° 34' 35.475" ✓	
<div></div> <div></div>			
REMARKS Section 16 is an irregular section and larger than one square mile. Plat Map Scale - 1 Square = 682.25 feet ✓ <i>Special Project</i>			
<b>INSTRUCTIONS</b> On the above plat, show distance of the proposed well from the two nearest section lines, the nearest lease line, and from the nearest well on the same lease completed in or drilling to the same reservoir. Do not confuse survey lines with lease lines. See rule 10 CSR 50-2.030 for survey requirements. Lease lines must be marked.		This is to certify that I have executed a survey to accurately locate oil and gas wells in accordance with 10 CSR 50-2.030 and that the results are correctly shown on the above plat.	
REGISTERED LAND SURVEY		NUMBER	





## Missouri Department of Natural Resources

### Geographic Information Systems

## Check Location

Select a coordinate format, enter a pair of coordinates in the boxes below it, and then press the SUBMIT button. Please be patient while your information is retrieved. Your coordinates will be converted to the other formats, the information on the right-hand side of the page will be filled in based on your coordinates, and a map will be generated. NOTE: All coordinates must use the North American Datum of 1983 (NAD83).

☐ Universal Transverse Mercator  
[Zone 15 North]

Easting  
363125.62230896764 meters  
Northing  
4297302.766645743 meters

☐ Decimal Degrees

Latitude  
38.813873888888885 °  
Longitude  
-94.57652083333333 °

☒ Degrees, Minutes and Seconds

Latitude Degrees  
38 °  
Latitude Minutes  
48 '  
Latitude Seconds  
49.946 ''  
Longitude Degrees  
-94 °  
Longitude Minutes  
34 '  
Longitude Seconds  
35.475 ''

### Metadata

- [Interstate Highways](#)
- [US Highways](#)
- [State Highways](#)
- [Railroad](#)
- [Major and Minor Roads](#)
- [County Boundary](#)
- [Lakes](#)
- [Major Rivers](#)
- [Rivers and Streams](#)
- [Missouri River](#)
- [Mississippi River](#)
- [Municipal](#)

<b>UTM Zone 15N [Easting, Northing]</b>	[ 363125.6, 4297302.7 ] meters
<b>Decimal Degrees [Lat, Lon]</b>	[ 38.813873°, -94.576521° ]
<b>Deg, Min, Sec [Lat, Lon]</b>	[ 38° 48' 49.9", -94° 34' 35.4" ]
<b>County Name</b>	Cass
<b>County FIPS Code</b>	037
<b>Legal Description</b>	Section 16 T46N R33W
<b>Municipality</b>	NO VALUE
<b>House District</b>	123
<b>Senate District</b>	31
<b>Congressional District</b>	5
<b>MoDNR Region</b>	Kansas City Regional Office
<b>USGS 1:24,000 Quadrangle</b>	Belton [38094-G5]
<b>8 Digit Watershed</b>	10300101 [Lower Missouri-Crooked]
<b>10 Digit Watershed</b>	1030010101 [Blue River]
<b>12 Digit Watershed</b>	103001010104 [Camp Branch-Blue River]
<b>Special Well Drilling Area</b>	Area 2
<b>Ecological Drainage Unit</b>	Central Plains/Blackwater/Lamine
<b>Level III Ecoregion</b>	Central Irregular Plains
<b>Query Time</b>	5.953 s

Rows with **red** text indicate that the input location is too close to a boundary to produce reliable results.

NOTE: A result of 'NO VALUE' is usually an indication that no data was found for the location. For example, not every point in Missouri will lie within a municipal boundary, so some will result in a 'NO VALUE'. If 'County Name' results in 'NO VALUE', your point probably lies outside the state.

Well ID: #005390

Elev. 1069

$\frac{P}{M}$ : 229' elev.  $P_c - M$ : 345'













Well ID: #026255 in lease

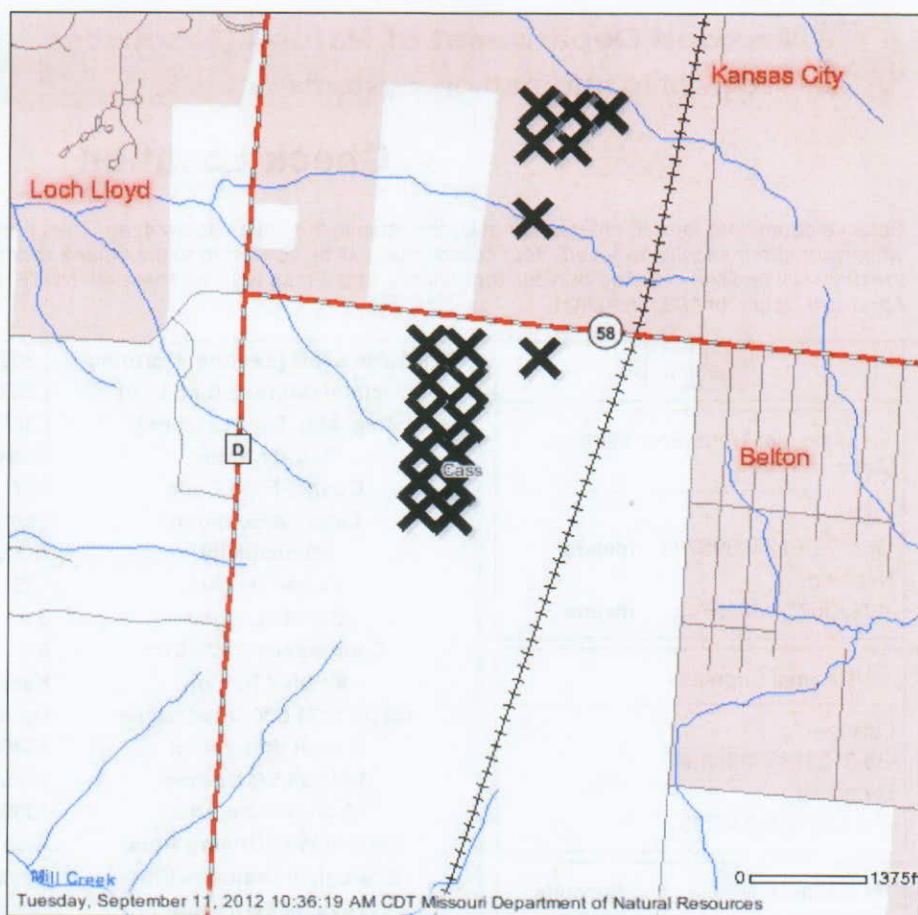
$P_c$ : 535' TD

1083-535-345

$\Rightarrow \frac{P}{M} \sim 203'$  elev.

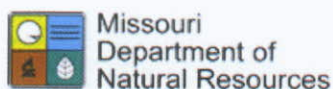


- Legend**
-  Interstate Highways
  -  US Highways
  -  State Highways
  -  Railroad
  -  Major and Minor Roads
  -  County Boundary
  -  Lakes
  -  Major Rivers
  -  Rivers and Streams
  -  Missouri River
  -  Mississippi River
  -  Municipal



View Scale 1:24,000

DISCLAIMER: Although this map has been compiled by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the data and related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the department in the use of these data or related materials.



P.O. Box 176, Jefferson City, MO 65102  
 800-361-4827 / 573-751-3443  
 E-mail: [contact@dnr.mo.gov](mailto:contact@dnr.mo.gov)

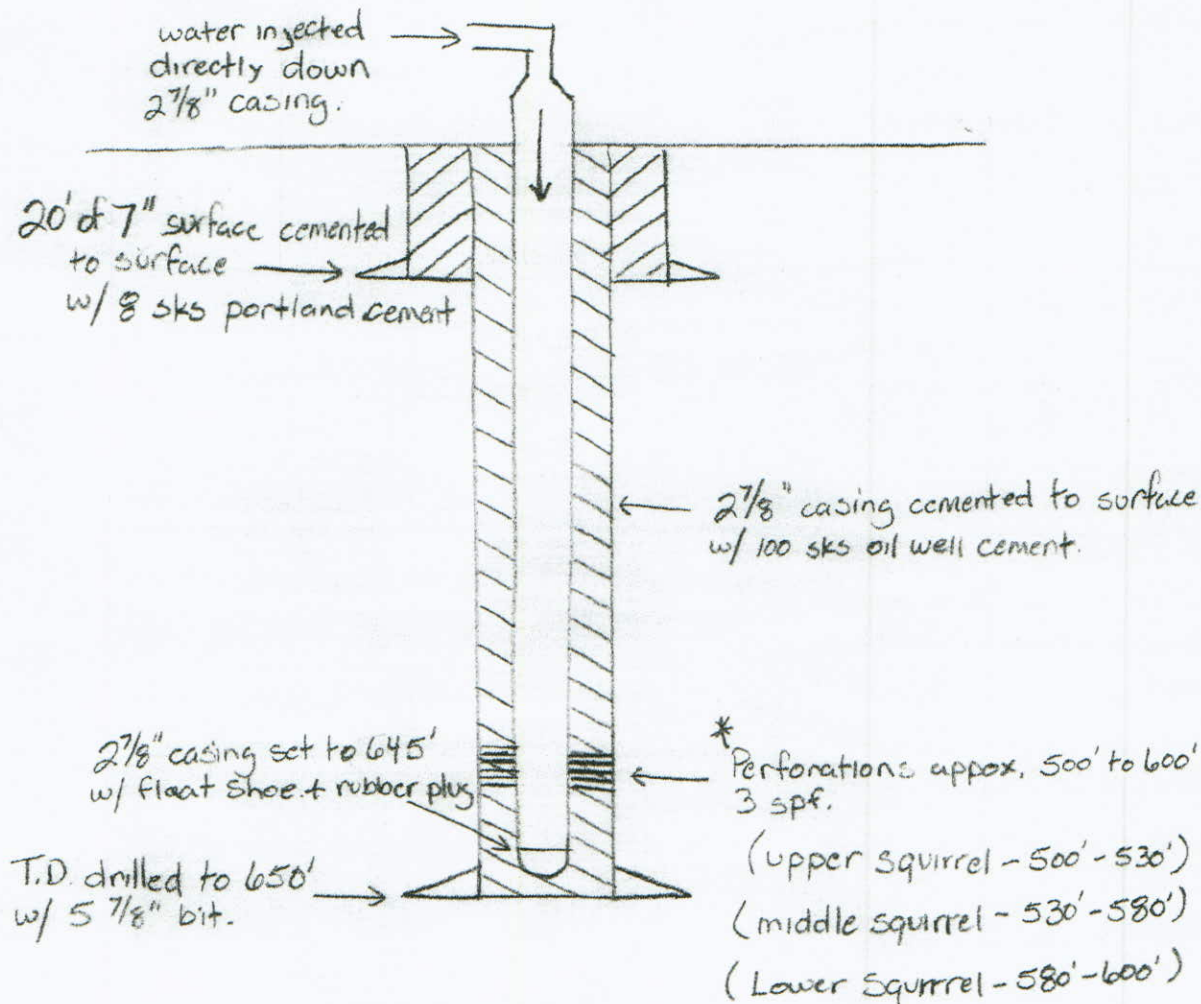




STATE OF MISSOURI  
MISSOURI DEPARTMENT OF NATURAL RESOURCES  
GEOLOGICAL SURVEY PROGRAM  
**INJECTION WELL SCHEMATIC**

OGC-11

COUNTY Cass	PERMIT NUMBER	OPERATOR Kansas Resource Exploration & Development	WELL NUMBER <b>PW-89</b>
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\* Upper, middle and lower Squirrel sections confined by shale and limestone.

INSTRUCTIONS ON THE ABOVE SPACE DRAW A NEAT, ACCURATE SCHEMATIC DIAGRAM OF THE APPLICANT INJECTION WELL, INCLUDING THE FOLLOWING: CONFIGURATION OF WELLHEAD, TOTAL DEPTH OR PLUG BACK TOTAL DEPTH, DEPTH OF ALL INJECTION OR DISPOSAL INTERVALS, AND THEIR FORMATION NAMES, LITHOLOGY OF ALL FORMATIONS PENETRATED, DEPTHS OF THE TOPS AND BOTTOMS OF ALL CASING AND TUBING, SIZE AND GRADE OF ALL CASING AND TUBING, AND THE TYPE AND DEPTH OF PACKER, DEPTH, LOCATION, AND TYPE OF ALL CEMENT, DEPTH OF ALL PERFORATIONS AND SQUEEZE JOBS, AND GEOLOGIC NAME AND DEPTH TO BOTTOM OF ALL UNDERGROUND SOURCES OF DRINKING WATER WHICH MAY BE AFFECTED BY THE INJECTION. USE BACK IF ADDITIONAL SPACE IS NEEDED, OR ATTACH SHEET.



## Well Schematic, Continued

The surface casing is 7" in diameter and is new, limited service grade pipe. The 7" is drifted and tested to 7,000 lbs. and weighs at least 17 lbs. per foot. The surface casing will be set to a minimum depth of 20 feet and extend 6 inches above the surface. Approximately 8 sacks of Portland cement will be circulated to surface and will secure the well and ensure the contents of the well bore are sealed off from sources of drinking water. The production casing used is 2 7/8" EUE upset, drifted and tested to 7,000 lbs. No tubing will be ran in the injection wells, the injection fluid will be injected directly down the 2 7/8" casing. The total depth of the well will be approximately 650 feet drilled with a 5 5/8" bit. A 2 7/8" flapper type float shoe will be set at the base of the 2 7/8" casing pipe (645 feet) with centralizers installed to center the casing inside the well bore for better cement bonding. The 2 7/8" casing will be cemented from 650 feet to surface using a 2 7/8" rubber plug for displacing the cement. Approximately 100 sacks of high-grade Oil Well cement will be used to cement all wells. This cement will ensure that no contents of the pipe will leave the well bore. The top of the 2 7/8" casing will extend approximately one foot above ground level. After the cement has cured and effectively bonded to the 2 7/8" casing, perforations will be made in the Squirrel Sandstone formation from approximately 500-600 feet, depending on where the oil sand is present at this particular location. Wells will be shot with 3 perforations per foot where the squirrel sandstone oil reservoir is present and capable of water injection. No water sources are present at this depth and will not be affected by these perforations or the injection. The relevant sources of drinking water are located less than 20 feet below surface. The 7" surface pipe and durable Portland cement ensures these water sources will remain free from contamination from drilling and injection activity. Other sources of potential usable water may be present, however not always potable, in the Pennsylvanian and Mississippian formations located approximately 150 feet or deeper below the base of the Squirrel Sandstone.

The lithology of all formations penetrated by the wellbore are as follows:

<u>Formation</u>	<u>Total Depth (feet)</u>
Soil	0 – 2
Clay	2 – 6
Lime	6 – 28
Shale	28 – 49
Lime	49 – 64
Shale	64 – 69
Red Bed	69 – 78
Shale	78 – 82

Lime	82 – 87	
Shale	87 – 105	
Gray Sand	105 – 124	
Shale	124 – 128	
Lime	128 – 130	
Shale	130 – 147	
Lime	147 – 177	
Shale (Slate 183 – 184)	177 – 186	
Lime	186 – 204	
Shale (Slate 207 – 208)	204 – 209	
Lime	209 – 211	
Shale	211 – 214	
Lime “Hertha”	214 – 220	<b>Top Pawnee Limestone</b>
Shale	220 – 259	
Lime	259 – 260	
Gray Sand “Knobtown”	260 – 262	
Shale	262 – 324	
Gray Sand	324 – 329	
Shale	329 – 358	
Gray Sand	358 – 362	<b>Base Pawnee Limestone</b>
Shale	362 – 399	<b>Top Labette Shale</b>
Lime	399 – 401	
Shale	401 – 404	
Lime	404 – 406	
Shale (Slate 411 – 412)	406 – 417	
Lime	417 – 424	
Shale	424 – 427	
Gray Sand	427 – 431	<b>Base Labette Shale</b>



Shale	431 – 443	<b>Top Fort Scott</b>
Lime	443 – 448	<b>BlackJack Creek Limestone</b>
Shale (Slate 452 – 453)	448 – 469	<b>Summit Coal</b>
Gray Sand	469 – 471	<b>Base Fort Scott</b>
Sdy. Shale	471 – 501	
Very laminated Sand	501 – 502	<b>Top - Squirrel Sandstone</b>
Sandy Lime	502 – 503	
Slightly lamin. Sand	503 – 504	
Sandy Lime	504 – 505	
Solid Sand	505 – 506.5	
Shale	506.5 – 507	
Slightly lamin. Sand	507 – 507.5	
Sandy Shale	507.5 – 509.5	
Solid Sand	509.5 – 510.5	
Sandy Lime	510.5 – 511.5	
Solid Sand	511.5 – 515.5	
Sandy Lime	515.5 – 518	
Solid Sand	518 – 520	
Sandy Lime	520 – 521	
Solid Sand	521 – 525	
Sandy Lime	525 – 526	
Laminated Sand	526 – 527	
Sandy Shale	527 – 528.5	
Sandy Lime	528.5 – 530	
Solid Sand	530 – 533	
Sandy Lime	533 – 534	
Sandy Shale	534 – 535	
Slightly laminated Sand	535 – 536.5	

Sandy Lime	536.5 – 538	
Solid Sand	538 – 539	
Lime and Shells	539 – 541	
Sand lamin. w/ Sandy Lime	541 – 542	
Lime and Shells	542 – 543	
Solid Sand	543 – 544.5	
Sandy Lime and Shells	544.5 – 547.5	
Sand and Shells	547.5 – 548.5	
Lime and Shells	548.5 – 552	
Solid Sand	552 – 553	
Lime and Shells	553 – 555.5	
Sand and Shells	555.5 – 559.5	
Lime and Shells	559.5 – 563.5	
Solid Sand	563.5 – 582.5	
Slightly laminated	582.5 – 583.5	
Shale and Shells	583.5 – 587.5	
Solid Sand	587.5 – 590.5	
Sand and Shells	590.5 – 591.5	
Solid Sand	591.5 – 593	
Lime	593 – 593.5	
Very laminated Sand	593.5 – 596	<b>Base – Squirrel Sandstone</b>
Shale (Slate 610 – 611)	596 – 616	<b>Top – Verdigris</b>
Lime	616 – 617	<b>Ardmore Limestone</b>
Shale (Slate 621 – 622)	617 – 650	<b>Oakley Shale</b>



Belton Unit, Cass County, Missouri

Re: Closure Pressure

Attached is a reproduction from "*Production Operations, Vol. 2*" by Allen and Roberts describing the fracturing pressures in a reservoir.

The fracture propagation pressure is approximately the same as the closure pressure, although slightly higher. This difference is less significant in low pressure reservoirs such as the ones in the Cherokee Basin, consequently, they are considered to be the same. The fracture propagation pressure is the same as the instantaneous shut-in pressure (ISIP) experienced upon cessation of a hydraulic fracture treatment. The ISIP from a fracture procedure is the surface pressure measurement. Bottom-hole ISIP must be calculated by adding the surface ISIP and the product of the depth to mid-perforations (feet) and the pressure gradient of the fluid in the wellbore (psi/foot). For fresh water the fluid gradient is 0.434 psi/foot. Since the fluid in fracture operations is more dense than fresh water most engineers estimate the bottom-hole ISIP with a higher gradient. The state of Oklahoma uses a gradient of 0.50 psi/foot.

Utilizing ISIP's experienced at Belton, and a fresh water gradient of 0.434, the calculated bottom-hole ISIPs are:

WELL	DEPTH TO MID-PERF	ISIP (Surface)	ISIP (Perfs)
R32	626	400	672
R32	585	350	604
R31	600	400	660
R31	552	350	640
R47	620	325	594
AD20	536	400	633
AD20	582.5	400	653
AD9-2	610	400	665
AD9-2	507	400	620
AD16-2	544	400	636

The fracture propagation pressure is the pressure in which the aperture of the existing fractures can begin to be opened. An increase in injection rate is noted at this point on injection step-rate tests. At injection pressures at, or slightly above, the ISIP, the fractures in the immediate vicinity of the wellbore (inches) may be affected but not into the reservoir significantly. In actual injection operations of a waterflood at ISIP, fractures wouldn't be created beyond the region adjacent to the wellbore because of; 1) fluid leak-off into the formation, 2) the injection of a low viscosity fluid, and 3) the extremely low injection rates - far less than what is necessary to create a fracture.

minimum stress at the borehole, and must also overcome the tensile strength of the rock. This can be expressed as follows:

$$(P_i)_v = 3\bar{\sigma}_{h_2} - \bar{\sigma}_{h_1} + S_h + P \quad (5)$$

where:

$(P_i)_v$  = borehole pressure required to initiate vertical fracture

$\bar{\sigma}_{h_1}$  = maximum principal horizontal matrix stress

$\bar{\sigma}_{h_2}$  = minimum principal horizontal matrix stress

$S_h$  = horizontal tensile strength of rock

$P$  = formation pore pressure

#### Penetrating Fluid Reduces Breakdown Pressure—

A penetrating fluid increases the area over which pressurized fluid contacts the formation and can reduce the pressure necessary to initiate fracturing.

Laboratory and theoretical work by Fairhurst and Haimson<sup>21</sup> provides a basis for estimation of the magnitude of reduction in openhole. Generally reduction may be on the order of 25 to 40% in openhole.

**Perforation Density and Orientation**—Recent laboratory work in cased hole shows that breakdown or frac initiation pressure is affected by the number and arrangement of perforations.<sup>22</sup>

The existence of casing and the arrangement of perforations have little effect on created fracture orientation, but breakdown pressure is reduced by increased number of perforations. The practice of perforating with all shots in a vertical line on one side of the casing, Figure 8-6 significantly increases

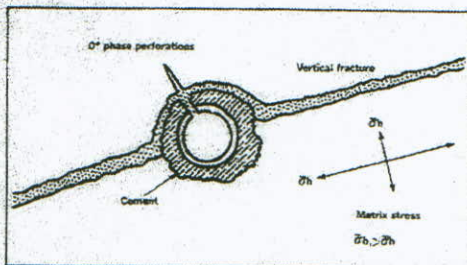


FIG. 8-6—Orientation of perforation vs. least horizontal matrix stress. Condition resulting in highest breakdown pressure.

breakdown pressure if the perforations happen to be oriented 90° to the azimuth of the vertical fracture plane. Orientation of perforations does not affect azimuth of the vertical fracture however.

#### Fracture Propagation

Once the fracture has been created and invaded by pressured fluid, the stress concentration near the wellbore is reduced, and the hydraulic pressure required to extend the fracture must merely overcome the component of the undisturbed stress field normal to the plane of the fracture.

**Measuring Propagation Pressure and Frac Gradient**—The fracture propagation pressure (and frac gradient) can be obtained during the fracturing operation by recording the wellhead pressure immediately after the pumps are shut down following injection into the fracture (Figure 8-7). Since the frac gradient is increased by increased pore pressure, this measurement should be made before the pore pressure is significantly raised by the injected frac fluid.

Wellhead instantaneous shut-in pressure, corrected to the hole bottom by adding the hydrostatic pressure of the wellbore fluid column, is the fracture propagation pressure. Fracture gradient is the fracture propagation pressure divided by the formation depth.

**Measuring Rock Matrix Stress**—The minimum horizontal rock matrix stress is then:

$$\bar{\sigma}_{h_1} = \text{propagation pressure} - \text{pore pressure}$$

This stress is of particular interest because it is the stress which propping agents must withstand in order to hold the fracture open. In actual practice pore pressure can be equated to static reservoir pressure provided fracture propagation pressure is measured before significant frac fluid is injected to raise the pore pressure level near the wellbore.

It should be noted that proppant in the critical area near the wellbore is subjected to more stress than that further away due to lower pore pressure near the wellbore in the producing process, Figure 8-8. This effect may be significant at high drawdown pressures.

#### Fracture Orientation

**Fracture Propagates Perpendicular to Smallest Stress**—Rocks fracture in a plane perpendicular to



Belton Unit, Cass County, Missouri

Re: Injection Volumes

Injection volumes are determined by using analogy from previous squirrel sandstone water floods that contain similar reservoir characteristics. In the case of the Belton Unit we plan to inject 1 barrel of water for every 1 net foot of oil bearing sandstone. (assuming this rate does not exceed the maximum approved injection pressure) Depending on the duration and impact of the surrounding wells some injection wells may ultimately inject 3 barrels of water for every 1 net foot of oil bearing sandstone.

Due to the permeability variance of the reservoir we typically will not exceed 15' of perforations per injection well.

Example;

Year 1

15' perforations x 1 bbl/ft = 15 BPD injection rate

Year 2

15' perforations x 2 bbls/ft = 30 BPD injection rate

Year 3

15' perforations x 3 bbls/ft = 45 BPD injection rate

We typically do not exceed 3 bbls/ft injection rate, which is why we are requesting only 50 BPD rate.

**AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL**

**INSTRUCTIONS**

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	R-1	569 FROM (N) SEC LINE 2412 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	619'	O	04/08/1999	04/13/1999	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-2	1484 FROM (N) SEC LINE 1024 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	600'	O	06/04/1999	06/10/1999	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-3	1484 FROM (N) SEC LINE 2423 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	665'	O	02/29/2000	03/02/2000	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-4	3232 FROM (N) SEC LINE 2013 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	680'	O	03/02/2000	03/07/2000	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-5	168 FROM (N) SEC LINE 2406 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	639'	O	04/23/2000	04/25/2000	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-6	171 FROM (N) SEC LINE 2890 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	608'	O	04/27/2000	04/28/2000	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-7	571 FROM (N) SEC LINE 2901 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	646'	O	05/01/2000	05/02/2000	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-8	1033 FROM (N) SEC LINE 8841 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	655'	O	05/05/2000	05/08/2000	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-9	1008 FROM (N) SEC LINE 2418 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	651'	O	05/03/2000	05/05/2000	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump



**AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL**

**INSTRUCTIONS**

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	R-10	1005 FROM (N) (S) SEC LINE 1980 FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	627'	O	05/15/2000	05/16/2000	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-11	567 FROM (N) (S) SEC LINE 1966 FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	626'	O	05/10/2000	05/12/2000	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-12	142 FROM (N) (S) SEC LINE 1951 FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	642'	O	05/16/2000	05/18/2000	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-13	144 FROM (N) (S) SEC LINE 1983 FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	620'	O	05/22/2000	05/24/2000	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-14	174 FROM (N) (S) SEC LINE 3335 FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	637'	O	09/17/2001	09/19/2001	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-15	573 FROM (N) (S) SEC LINE 3335 FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	621'	O	12/15/2000	12/20/2000	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-16	513 FROM (N) (S) SEC LINE 2546 FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	652.5'	O	10/13/2003	10/15/2003	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-17	340 FROM (N) (S) SEC LINE 1071 FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	686'	O	01/29/2004	01/30/2004	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-18	2810 FROM (N) (S) SEC LINE 1633 FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	914.5'	O	01/07/2004	01/09/2004	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump

**AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL**

**INSTRUCTIONS**

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	R-19	<del>4132</del> FROM (N) (S) SEC LINE <del>2010</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	621.5'	O	02/12/2004	02/13/2004	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-20	<del>4132</del> FROM (N) (S) SEC LINE <del>2015</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	661'	O	01/18/2008	01/22/2008	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-21	<del>4132</del> FROM (N) (S) SEC LINE <del>2015</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	635'	O	01/14/2008	01/16/2008	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-22	<del>4132</del> FROM (N) (S) SEC LINE <del>1603</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	660'	O	12/04/2008	N/A	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-23	<del>3320</del> FROM (N) (S) SEC LINE <del>2425</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	660'	O	U	N/A	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-24	<del>3320</del> FROM (N) (S) SEC LINE <del>2425</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	658'	O	01/25/2008	N/A	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-25	<del>3320</del> FROM (N) (S) SEC LINE <del>2425</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	660'	O	U	N/A	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	R-1	<del>368</del> FROM (N) (S) SEC LINE <del>2464</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	623'	<del>Plugged</del>	07/26/2000	08/31/2000	4 1/2" casing cemented to surface <del>Plugged 01/27/11 - squeezed cement 02/23 to surface</del>
Belton Unit	R-2	<del>795</del> FROM (N) (S) SEC LINE <del>2053</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	627'	I	U	U	4 1/2" casing cemented to surface



**AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL**

**INSTRUCTIONS**

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LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	R1-3	<del>1219</del> FROM (N) (S) SEC LINE <del>2167</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	635'	I	U	U	4 1/2" casing cemented to surface
Belton Unit	R1-4	<del>1219</del> FROM (N) (S) SEC LINE <del>2167</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	641'	I	08/25/2000	08/29/2000	4 1/2" casing cemented to surface
Belton Unit	R1-5	<del>1219</del> FROM (N) (S) SEC LINE <del>2167</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	637'	I	U	U	4 1/2" casing cemented to surface
Belton Unit	R1-6	<del>1219</del> FROM (N) (S) SEC LINE <del>2167</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	644'	Plugged	U	U	4 1/2" casing cemented to surface Plugged 10/27/12 - squeezed cement 10/27/12 to surface
Belton Unit	WSW-1	<del>1219</del> FROM (N) (S) SEC LINE <del>2167</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	891'	W	04/16/2001	04/14/2001	Squeezed
Belton Unit	C-18	<del>1219</del> FROM (N) (S) SEC LINE <del>2167</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	571'	Plugged	U	U	4 1/2" casing cemented to surface Plugged 10/27/12 - squeezed cement 10/27/12 to surface
Belton Unit	RW-7	<del>1219</del> FROM (N) (S) SEC LINE <del>2167</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	638'	I	02/10/2004	02/11/2004	4 1/2" casing cemented to surface Plugged 10/27/12 - squeezed cement 10/27/12 to surface
Belton Unit	RW-8	<del>1219</del> FROM (N) (S) SEC LINE <del>2167</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	641.5'	I	02/12/2004	02/13/2004	4 1/2" casing cemented to surface
Belton Unit	RW-9	<del>1219</del> FROM (N) (S) SEC LINE <del>2167</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	647.5'	I	01/13/2004	01/15/2004	4 1/2" casing cemented to surface

**AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL**

**INSTRUCTIONS**

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LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	RW-10	<del>8025</del> FROM (N) (S) SEC LINE <del>8055</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	678'	I	02/02/2004	02/03/2004	4 1/2" casing cemented to surface
Belton Unit	RW-11	<del>8111</del> FROM (N) (S) SEC LINE <del>8113</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	652'	I	02/04/2004	02/06/2004	4 1/2" casing cemented to surface
Belton Unit	RW-13	<del>8152</del> FROM (N) (S) SEC LINE <del>8152</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	697'	I	02/06/2004	02/09/2004	4 1/2" casing cemented to surface
Belton Unit	RW-15	<del>8180</del> FROM (N) (S) SEC LINE <del>8205</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	660'	I	11/26/2008	N/A	4 1/2" casing cemented to surface
Belton Unit	RW-16	<del>8180</del> FROM (N) (S) SEC LINE <del>8185</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	660'	I	12/02/2008	N/A	4 1/2" casing cemented to surface
Belton Unit	RW-19	<del>8340</del> FROM (N) (S) SEC LINE <del>8305</del> FROM (E) (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	661'	I	12/08/2008	N/A	4 1/2" casing cemented to surface
Belton Unit	AD-1	<del>2420</del> FROM (N) (S) SEC LINE <del>2420</del> FROM (E) (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	615'	O	12/03/2007	01/04/2008	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-2	<del>2000</del> FROM (N) (S) SEC LINE <del>2000</del> FROM (E) (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	657'	O	12/06/2007	12/10/2007	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-3	<del>3800</del> FROM (N) (S) SEC LINE <del>3800</del> FROM (E) (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	637'	O	08/31/1987	U	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump



# AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL

## INSTRUCTIONS

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	AD-4	220 FROM (N) SEC LINE 425 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	666'	O	07/14/1987	07/16/1987	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-5	220 FROM (N) SEC LINE 416 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	679'	O	06/21/1987	06/25/1987	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-6	224 FROM (N) SEC LINE 516 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	708'	O	01/31/2008	02/19/2008	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-7	254 FROM (N) SEC LINE 298 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	630'	O	12/12/2007	12/14/2007	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-8	630 FROM (N) SEC LINE 340 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	622'	O	05/14/1999	05/27/1999	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-9	644 FROM (N) SEC LINE 385 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	662'	Plugged	08/25/1987	1987	4 1/2" casing cemented to surface Squeezed cement into formation to surface on 04/04/2012
Belton Unit	AD-10	662 FROM (N) SEC LINE 429 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	659'	O	05/25/1987	07/21/1987	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-11	621 FROM (N) SEC LINE 478 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	665'	Plugged	1987	1987	4 1/2" casing cemented to surface Squeezed cement into formation to surface on 03/19/2012
Belton Unit	AD-12	1210 FROM (N) SEC LINE 380 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	710'	O	01/23/2008	02/26/2008	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump



**AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL**

**INSTRUCTIONS**

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	AD-13	1100 FROM (N) SEC LINE 2420 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	700'	Plugged	12/21/2007	N/A	Cemented from bottom to top on 12/27/2007
Belton Unit	AD-14	1061 FROM (N) SEC LINE 2405 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	609'	O	04/21/1999	05/13/1999	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-15	1210 FROM (N) SEC LINE 3601 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	617'	O	11/13/1989	11/14/1989	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-16	1100 FROM (N) SEC LINE 4225 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	666'	Plugged	07/23/1987	U-1987	4 1/2" casing cemented to surface Squeezed cement into formation to surface on 04/04/2012
Belton Unit	AD-17	1105 FROM (N) SEC LINE 4051 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	647'	O	U	U	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-18	1100 FROM (N) SEC LINE 300 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	676.5'	O	01/02/2008	02/26/2008	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-21	1535 FROM (N) SEC LINE 2809 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	656'	O	09/11/2003	09/12/2003	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-22	1539 FROM (N) SEC LINE 4212 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	650'	O	06/13/1999	06/18/1999	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-23	1541 FROM (N) SEC LINE 4044 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	644'	O	09/09/2003	09/11/2003	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump



**AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL**

**INSTRUCTIONS**

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LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	AD-24	SEC. 9 FROM (N) SEC LINE 300 FROM (E) SEC LINE	K.R.E.D.	672.5	O	12/27/2007	02/06/2008	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-28	SEC. 9 T. 46 N.R. 33W FROM (N) SEC LINE FROM (E) SEC LINE	K.R.E.D.	629'	O	07/08/1999	07/14/1999	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-29	SEC. 9 T. 46 N.R. 33W FROM (N) SEC LINE FROM (E) SEC LINE	K.R.E.D.	625'	O	06/18/1999	07/07/1999	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	AD-18	SEC. 9 T. 46 N.R. 33W FROM (N) SEC LINE FROM (E) SEC LINE	K.R.E.D.	651.5'	I	10/09/2003	10/10/2003	4 1/2" casing cemented to surface
Belton Unit	AD-19	SEC. 9 T. 46 N.R. 33W FROM (N) SEC LINE FROM (E) SEC LINE	K.R.E.D.	654.5'	I	10/07/2003	10/08/2003	4 1/2" casing cemented to surface
Belton Unit	AD-24	SEC. 9 T. 46 N.R. 33W FROM (N) SEC LINE FROM (E) SEC LINE	K.R.E.D.	662'	I	09/16/2003	09/17/2003	4 1/2" casing cemented to surface
Belton Unit	AD-25	SEC. 9 T. 46 N.R. 33W FROM (N) SEC LINE FROM (E) SEC LINE	K.R.E.D.	651.5'	I	09/12/2003	09/15/2003	4 1/2" casing cemented to surface
Belton Unit	AD-26	SEC. 9 T. 46 N.R. 33W FROM (N) SEC LINE FROM (E) SEC LINE	K.R.E.D.	650.5'	I	09/17/2003	09/19/2003	4 1/2" casing cemented to surface
Belton Unit	AD-27	SEC. 9 T. 46 N.R. 33W FROM (N) SEC LINE FROM (E) SEC LINE	K.R.E.D.	674.1'	I	01/04/2008	04/16/2008	4 1/2" casing cemented to surface

**AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL**

**INSTRUCTIONS**

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	ADI-30	850 FROM (N) SEC LINE 3200 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	627.7'	I	12/19/2007	04/16/2008	4 1/2" casing cemented to surface
Belton Unit	ADI-31	860 FROM (N) SEC LINE 3613 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	633'	I	05/27/1999	06/04/1999	4 1/2" casing cemented to surface
Belton Unit	ADI-32	871 FROM (N) SEC LINE 4034 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	649'	I	U	U	4 1/2" casing cemented to surface
Belton Unit	ADI-33	881 FROM (N) SEC LINE 4454 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	642'	I	U	U	4 1/2" casing cemented to surface
Belton Unit	ADI-34	879 FROM (N) SEC LINE 4896 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	663	I	U	U	4 1/2" casing cemented to surface
Belton Unit	ADI-37	440 FROM (N) SEC LINE 2300 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	618.2	I	12/13/2007	04/16/2008	4 1/2" casing cemented to surface
Belton Unit	ADI-38	446 FROM (N) SEC LINE 1760 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	668.9'	I	12/17/2007	04/16/2008	4 1/2" casing cemented to surface
Belton Unit	ADI-39	441 FROM (N) SEC LINE 4053 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	631'	I	U	U	4 1/2" casing cemented to surface
Belton Unit	ADI-40	441 FROM (N) SEC LINE 4165 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	664'	I	U	U	4 1/2" casing cemented to surface



**AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL**

**INSTRUCTIONS**

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	ADJ-41	442 FROM (N) SEC LINE 1909 FROM (E) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	600' est	I	✓	✓	4 1/2" casing cemented to surface
Belton Unit	OH-1	8212 FROM (N) SEC LINE 2400 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	600' est	O	✓	✓	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	OH-2	8201 FROM (N) SEC LINE 3051 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	600' est	O	✓	✓	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	OH-3	1931 FROM (N) SEC LINE 3408 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	600' est	O	✓	✓	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	OH-4	1940 FROM (N) SEC LINE 2818 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	600' est	O	✓	✓	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	OH-5	833 FROM (N) SEC LINE 5124 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	600' est	O	✓	✓	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Belton Unit	OH-6	919 FROM (N) SEC LINE 5416 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	600' est	Plugged	✓	✓	Squeezed cement into formation to surface
Belton Unit	OH-7	753 FROM (N) SEC LINE 3100 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	600' est	Plugged	✓	✓	Squeezed cement into formation to surface
Belton Unit	OH-8	138 FROM (N) SEC LINE 3441 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	600' est	Plugged	✓	✓	Squeezed cement into formation to surface

**AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL**

**INSTRUCTIONS**

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	OH-9	604 FROM (N) SEC LINE 5229 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	600' est	Plugged	✓	✓	Squeezed cement into formation to surface
Belton Unit	UK-1	1520 FROM (N) SEC LINE 1300 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	U	Plugged	✓	✓	4 1/2" casing cemented to surface Squeezed cement into formation to surface on 04/17/2012
Belton Unit	UK-2	1321 FROM (N) SEC LINE 1936 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	U	Plugged	✓	✓	4 1/2" casing cemented to surface Squeezed cement into formation to surface on 04/17/2012
Belton Unit	UK-3	1353 FROM (N) SEC LINE 1396 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	U	O	✓	✓	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Clark-Berry	CB-1	1289 FROM (N) SEC LINE 2189 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	625'	O	✓	✓	2 7/8" with 1" tubing and insert pump
Clark-Berry	CB-2	1276 FROM (N) SEC LINE 3006 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	625'	O	✓	✓	2 7/8" with 1" tubing and insert pump
Clark-Berry	CB-3	1310 FROM (N) SEC LINE 3072 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	625'	O	✓	✓	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Clark-Berry	CB-4	1281 FROM (N) SEC LINE 3424 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	619'	O	✓	✓	4 1/2" casing cemented to surface 2 3/8" tubing 3/4" rods and insert pump
Clark-Berry	CB-1	1050 FROM (N) SEC LINE 6211 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	629'	I	✓	✓	4 1/2" casing cemented to surface



## INSTRUCTIONS

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPUDDED	DATE COMPLETED	CONSTRUCTION
Clark-Berry	CBI-2	3487 FROM (N)(S) SEC LINE 5233 FROM (E)(W) SEC LINE	K.R.E.D.	634'	I	04/02/1999	04/07/1999	4 1/2" casing cemented to surface
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# AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL

## INSTRUCTIONS

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	R-26	5100 FROM (N) SEC LINE 5794 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	643'	Plugged	03/08/2012	Not complete	Set 21 feet of 8 5/8" surface pipe Squeezed cement from 643' to surface to plug well on 04/17/2012
Belton Unit	R-27	4810 FROM (N) SEC LINE 5818 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	700'	O	04/06/2012		685' of 2 7/8" casing cemented to surface
Belton Unit	R-28	4451 FROM (N) SEC LINE 5814 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	681'	O	04/10/2012		656' of 2 7/8" casing cemented to surface
Belton Unit	R-29	4453 FROM (N) SEC LINE 10740 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	750'	O	03/24/2012	05/10/2012	740' of 4 1/2" casing cemented to surface
Belton Unit	R-30	4853 FROM (N) SEC LINE 1174 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	750'	O	03/23/2012	04/30/2012	697' of 4 1/2" casing cemented to surface
Belton Unit	R-31	5268 FROM (N) SEC LINE 1302 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	750'	O	03/27/2012	04/27/2012	740' of 4 1/2" casing cemented to surface
Belton Unit	R-32	4894 FROM (N) SEC LINE 1240 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	750'	O	03/14/2012	05/25/2012	743' of 4 1/2" casing cemented to surface
Belton Unit	R-33	4924 FROM (N) SEC LINE 1240 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	700'	O	03/21/2012	05/10/2012	663' of 4 1/2" casing cemented to surface
Belton Unit	R-36	5353 FROM (N) SEC LINE 1634 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D	760'	O	04/02/2012	04/30/2012	733.5' of 4 1/2" casing cemented to surface



# AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL

## INSTRUCTIONS

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	R-41	SEC. 16 FROM (N) SEC LINE 3340 FROM (W) SEC LINE	K.R.E.D.	643'	O	06/12/2012	Not complete	' of 4 1/2" casing cemented to surface
Belton Unit	R-42	SEC. 16 T. 46 N.R. 33W 3285 FROM (N) SEC LINE 3340 FROM (W) SEC LINE	K.R.E.D.	980'	O	06/06/2012	Not complete	687' of 4 1/2" casing cemented to surface
Belton Unit	R-43	SEC. 16 T. 46 N.R. 33W 3281 FROM (N) SEC LINE 3471 FROM (W) SEC LINE	K.R.E.D.	770'	O	05/09/2012	05/30/2012	740' of 4 1/2" casing cemented to surface
Belton Unit	R-44	SEC. 16 T. 46 N.R. 33W 3300 FROM (N) SEC LINE 3570 FROM (W) SEC LINE	K.R.E.D.	760'	O	05/11/2012	05/31/2012	727' of 4 1/2" casing cemented to surface
Belton Unit	R-47	SEC. 16 T. 46 N.R. 33W 3444 FROM (N) SEC LINE 2543 FROM (W) SEC LINE	K.R.E.D.	760'	O	05/08/2012	06/01/2012	728' of 4 1/2" casing cemented to surface
Belton Unit	R-48	SEC. 16 T. 46 N.R. 33W 3446 FROM (N) SEC LINE 2587 FROM (W) SEC LINE	K.R.E.D.	770'	O	07/18/2012	Not complete	750' of 2 7/8" casing cemented to surface
Belton Unit	R-49	SEC. 16 T. 46 N.R. 33W 3471 FROM (N) SEC LINE 3114 FROM (W) SEC LINE	K.R.E.D.	730'	O	06/30/2012		718' of 2 7/8" casing cemented to surface
Belton Unit	R-51	SEC. 16 T. 46 N.R. 33W 4058 FROM (N) SEC LINE 2518 FROM (W) SEC LINE	K.R.E.D.	730'	O	06/08/2012		700' of 4 1/2" casing cemented to surface
		SEC. 16 T. 46 N.R. 33W FROM (N/S) SEC LINE FROM (E/W) SEC LINE						

**AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL**

**INSTRUCTIONS**

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	RW-22	4405 FROM (N) SEC LINE 1087 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	730'	I	06/01/2012	Not complete	696' of 2 7/8" casing cemented to surface
Belton Unit	RW-23	4405 FROM (N) SEC LINE 1433 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	730'	I	05/22/2012	complete	691' of 2 7/8" casing cemented to surface
Belton Unit	RW-24	4407 FROM (N) SEC LINE 1441 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	730'	I	05/30/2012	Not complete	565' of 2 7/8" casing cemented to surface
Belton Unit	RW-25	5119 FROM (N) SEC LINE 1839 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	750'	I	05/18/2012	07/06/2012	711' of 2 7/8" casing cemented to surface
Belton Unit	RW-26	4448 FROM (N) SEC LINE 1465 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	730'	I	05/23/2012	07/17/2012	692' of 2 7/8" casing cemented to surface
Belton Unit	RW-27	4618 FROM (N) SEC LINE 2304 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	730'	I	05/29/2012	07/17/2012	682' of 2 7/8" casing cemented to surface
Belton Unit	RW-37	5136 FROM (N) SEC LINE 3208 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	720'	I	05/14/2012	07/09/2012	695' of 2 7/8" casing cemented to surface
Belton Unit	RW-38	5120 FROM (N) SEC LINE 3219 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	730'	I	07/03/2012	Not complete	687' of 2 7/8" casing cemented to surface
Belton Unit	RW-39	5117 FROM (N) SEC LINE 3217 FROM (E) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	720'	I	05/16/2012	07/09/2012	686' of 2 7/8" casing cemented to surface



# AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL

## INSTRUCTIONS

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	RW-40	5105 FROM (N) SEC LINE 31405 FROM (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	730'	I	07/03/2012	Not complete	687' of 2 7/8" casing cemented to surface
Belton Unit	RW-43	4102 FROM (N) SEC LINE 3135 FROM (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	700'	I	06/14/2012	07/17/2012	672' of 2 7/8" casing cemented to surface
Belton Unit	RW-44	4185 FROM (N) SEC LINE 3185 FROM (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	730'	I	06/28/2012	Not complete	690' of 2 7/8" casing cemented to surface
Belton Unit	RW-45	4241 FROM (N) SEC LINE 3173 FROM (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	730'	I	07/11/2012		684' of 2 7/8" casing cemented to surface
Belton Unit	RW-46	4245 FROM (N) SEC LINE 3184 FROM (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	730'	I	07/13/2012		687' of 2 7/8" casing cemented to surface
Belton Unit	RW-47	4267 FROM (N) SEC LINE 3173 FROM (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	730'	I	07/13/2012		689' of 2 7/8" casing cemented to surface
Belton Unit	RW-48	4248 FROM (N) SEC LINE 3145 FROM (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	730'	I	07/13/2012		681' of 2 7/8" casing cemented to surface
Belton Unit	RW-49	4241 FROM (N) SEC LINE 3172 FROM (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	730'	I	06/13/2012	07/17/2012	675' of 2 7/8" casing cemented to surface
Belton Unit	RW-50	4182 FROM (N) SEC LINE 3125 FROM (W) SEC LINE SEC. 16 T. 46 N.R. 33W	K.R.E.D.	730'	I	06/30/2012	Not complete	659' of 2 7/8" casing cemented to surface

# AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL

## INSTRUCTIONS

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	AD-9-2	1463 FROM (N) SEC LINE 1500 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	760'	O	03/30/2012	05/07/2012	741' of 4 1/2" casing cemented to surface
Belton Unit	AD-11-2	1602 FROM (N) SEC LINE 1534 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	750'	O	03/12/2012	04/27/2012	737' of 4 1/2" casing cemented to surface
Belton Unit	AD-16-2	1157 FROM (N) SEC LINE 1084 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	760'	O	03/28/2012	04/27/2012	739' of 4 1/2" casing cemented to surface
Belton Unit	AD-20	1520 FROM (N) SEC LINE 1491 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	760'	O	03/29/2012	06/11/2012	740' of 4 1/2" casing cemented to surface
Belton Unit	AD-26	1465 FROM (N) SEC LINE 1460 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	770'	O	04/05/2012	06/13/2012	745' of 4 1/2" casing cemented to surface
Belton Unit	AD-27	1445 FROM (N) SEC LINE 1444 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	760'	O	03/30/2012	06/13/2012	741' of 4 1/2" casing cemented to surface
Belton Unit	AD-31	2346 FROM (N) SEC LINE 2342 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	701'	O	04/12/2012	Not Complete	688' of 2 7/8" casing cemented to surface
Belton Unit	AD-32	2408 FROM (N) SEC LINE 1816 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	760'	O	04/06/2012	06/28/2012	745' of 4 1/2" casing cemented to surface
Belton Unit	AD-33	2435 FROM (N) SEC LINE 1476 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	760'	O	04/03/2012	07/04/2012	741' of 4 1/2" casing cemented to surface



# AREA OF REVIEW WELLS (1/2 MILE RADIUS AROUND WELL) THAT PENETRATE THE INJECTION INTERVAL

## INSTRUCTIONS

In the grid below, place the descriptions of area of review wells (1/2 mile radius around well) of public record that penetrate the proposed injection zone. Complete the following: lease name, well number, location, owner, depth in feet, type of well (Oil = O, Gas = G, Water = W, Injection = I, Strat Test = S, Unknown = U, Other - specify), date spudded, date completed, and construction of the well. Give a brief but accurate description of the well's construction including all plugging and/or completion of information, detailing the cement, casing, and subsurface casing information.

LEASE	WELL NO.	LOCATION	OWNER	DEPTH	TYPE	DATE SPULDED	DATE COMPLETED	CONSTRUCTION
Belton Unit	AD 3-2	208 FROM (N) SEC LINE 1544 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	770'	O	06/15/2012	Not complete	713' of 4 1/2" casing cemented to surface
Belton Unit	AD 4-2	256 FROM (N) SEC LINE 1125 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	770'	O	06/22/2012		724' of 4 1/2" casing cemented to surface
Belton Unit	AD 5-2	148 FROM (N) SEC LINE 640 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	770'	O	06/20/2012		721' of 4 1/2" casing cemented to surface
Belton Unit	AD 3-4	2435 FROM (N) SEC LINE 1074 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	700'	O	05/04/2012	07/09/2012	686' of 4 1/2" casing cemented to surface
Belton Unit	AD 1-42	382 FROM (N) SEC LINE 446 FROM (W) SEC LINE SEC. 9 T. 46 N.R. 33W	K.R.E.D.	730'	I	07/19/2012	Not complete	686' of 2 7/8" casing cemented to surface
		FROM (N/S) SEC LINE FROM (E/W) SEC LINE SEC. T. N.R.						
		FROM (N/S) SEC LINE FROM (E/W) SEC LINE SEC. T. N.R.						
		FROM (N/S) SEC LINE FROM (E/W) SEC LINE SEC. T. N.R.						
		FROM (N/S) SEC LINE FROM (E/W) SEC LINE SEC. T. N.R.						

## AFFIDAVIT OF PUBLICATION

(Space above for recording information)

STATE OF MISSOURI  
COUNTY OF CASS

ss.

I, Janis Anslinger, being duly sworn according to law, state that I am the Classified Ad Manager of the Cass County Democrat-Missourian, a weekly newspaper of general circulation in the County of Cass, State of Missouri, where located; which newspaper has been admitted to the Post Office as periodical class matter in the City of Harrisonville, Missouri, the city of publication; which newspaper has been published regularly and consecutively for a period of three years and has a list of bonafide subscribers, voluntarily engaged as such who have paid or agreed to pay a stated price for a subscription for a definite period of time, and that such newspaper has complied with the provisions of Section 493.050, Revised Statutes of Missouri 2000, and Section 59.310, Revised Statutes of Missouri 2000. The affixed notice appeared in said newspaper in the following consecutive issues:

1<sup>st</sup> Insertion: Vol. 132 No. 39 13 day of July 20 122<sup>nd</sup> Insertion: Vol. \_\_\_\_\_ No. \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_3<sup>rd</sup> Insertion: Vol. \_\_\_\_\_ No. \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_4<sup>th</sup> Insertion: Vol. \_\_\_\_\_ No. \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_5<sup>th</sup> Insertion: Vol. \_\_\_\_\_ No. \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

*Janis Anslinger*  
Janis Anslinger, Classified Ad Manager

Subscribed and sworn to before me on this 13 day of July, 2012

*Julie M. Hicks*



State Geologist  
Missouri Oil & Gas Council  
P.O. Box 250  
Rolla, MO 65401

Written comments or requests for additional information regarding such wells should be directed within fifteen (15) days of this notice to the address below.

OK  
Kansas Resource Exploration & Development, LLC, 9393 W 110<sup>th</sup> St., Ste. 500, Overland Park, KS, 66210, has applied for 6 injection well permits to be drilled to an approximate depth of 650 feet. Saltwater will be injected into the Squirrel Sandstone formation for an Enhanced Oil Recovery Project at the following locations:  
#RW-84 4,690' from S line/3,167' from E line, Section 16, Township 46N, Range 33W  
#RW-85 4,674' from S line/2,710' from E line, Section 16, Township 46N, Range 33W  
#RW-86 5,129' from S line/3,217' from E line, Section 16, Township 46N, Range 33W  
#RW-87 5,110' from S line/2,752' from E line, Section 16, Township 46N, Range 33W  
#RW-88 4,252' from S line/3,171' from E line, Section 16, Township 46N, Range 33W  
#RW-89 4,250' from S line/2,728' from E line, Section 16, Township 46N, Range 33W



**MISSOURI**  
**Mechanical Integrity Test**

RECEIVED

FEB 22 2013

Mo Oil & Gas Council

Test Date: 2/13/2013

Operator: Kansas Resources Exploration & Development, LLC

Address: 9393 W. 110th St. Ste. 500  
Overland Park, Kansas 66210

Contact: Brad Kramer

Phone: 913-669-2253

Lease: Belton Unit

Well No.: RW-89

County: Cass

Permit No.: 20,998

**TEST INFORMATION**

Pressure

☒

Radioactive Tracer Survey

☐

Temperature Survey

☐

	Run #1	Run #2	Run #3	Run #4
Start Time:	12:00			
End Time:	12:30			
Length of Test:	30min			
Initial Pressure (PSI):	510#			
Ending Pressure (PSI):	510#			
Pressure Change:	0			

Fluid Used For Test (water, nitrogen, CO2, etc.): Air

Perforations: Not Perfed Yet

Comments: X 433 =

Pressured Casing up to 510

The bottom of the tested zone is shut in with Rubber Plug at a depth of 684.65 feet.  
In signing the form below, it is certified that the above indicated well was tested for mechanical integrity on the test date shown above.

Signature

Robert Reed

Operator, Contact Person or Approved Agent

Contractor

Title

FOR INTERNAL USE ONLY

Results were: Satisfactory ☒

Not Satisfactory ☐

Computer Update: ☒

Remarks: \_\_\_\_\_

State Agent: SAUER

Witnessed: Yes ☐

No ☒

!! FILE WITH PERMIT !!